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ABSTRACT

In order to study young children's awareness of interword space as a cueing convention and determine their ability to deal with language on an abstract level, 23 black kindergarten children who had been exposed to formal reading instruction were tested. In the first test children were asked to study cards on which a single word or groups of words were written. Each child was instructed to point out when the examiner pronounced either fewer or more words than listed on the card. The second test was a 15 item word reversal task in which subjects were required to reverse word pairs pronounced by the examiner. Results indicated that even after a year of formal reading instruction only a few children could demonstrate awareness of space as a cueing convention and that the ability to demonstrate this awareness was related to the ability to manipulate oral language. It can be concluded that children develop clarity about technical features of written language as they learn to read and that some level of cognitive maturity may facilitate the abstraction of these technical features. (Author/JF)

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Children's Awareness of Word Boundaries As A Cueing Convention in Written Language

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Introduction

A major task in beginning reading involves learning how language codes into print. Gibson and Levin (1975) cite attention to graphic information on the page as one of the first behaviors that must be learned. This attention to graphic information is essential if children are to detect word structure and abstract from written language the rules of correspondence between their phonological system and the orthographic system of English.

Do young children know where to look or what to look for? Our teaching techniques assume that they do, but research points to confusion on the child's part.

Related Research

Meltzer and Herse (1969) demonstrated that first graders do not have clear notions about graphic units of written language. The results of their study, which involved having children circle words in a written sentence, revealed that the notion of a word in written language as a string of print bounded by white spaces is not firmly established even after several months of first grade instruction. This information, however, would appear to be essential in the beginning stages of reading

CS004 242

if the child is to discover the correspondences between what is represented in speech and its written equivalent.

Research by Micnish (1974) indicates that after a year of reading instruction first grade readers could not locate individual words within a meaningful string when word boundary information was absent even though the examiner read the words to the subjects and they were only required to circle them.

Work by Downing and Oliver (1974) and Johns (1977) focused on children's confusion about the meaning of metalinguistic vocabulary used to talk about language. Their research indicates that children do not have a clear understanding of the referents of the oral language terms 'word', 'sound', and 'letter'. Thus, measurement of children's awareness of graphic cueing aspects of words is confounded by the necessity of using a metavocabulary. While there have been a number of studies dealing with children's awareness of interword space, it is difficult to draw conclusions from this research because studies have approached the problem from different perspectives using different methodology. Meltzer and Herse investigated word boundary awareness as a purely graphic phenomenon. Micnish, on the other hand, paired auditory and visual input, but children in her study were presented with a sentence which contained no spaces between words. Children had to have learned the graphemic equivalence of the spoken word in order to identify an individual word. No test of word identification in isolation

was given in Micnish's study.

In spite of methodological constraints, this research taken together substantiates confusion about graphic units that represent spoken words on the part of young readers and indicates that confusion persists even after considerable periods of instruction.

Theoretical, Developmental, and Experiental Factors That Could Contribute to Confusion

There are two possible reasons why this confusion should exist. Word boundaries in written language are not directly marked in spoken language. While information might be more accessable in words that have referents (e. g. apple) many segments are not marked in speech as they are in print (e. g. didja/did you), this information may therefore, only be acquired as children learn to read, although informal abstraction is hypothetically possible for prereading children who have been widely exposed to print.

A second factor that may complicate the abstraction of this knowledge may be the child's inability to deal with language on an abstract level. The developmental constraints on this ability have been widely attested in the literature (Karpova, 1966, Evans, 1975, Huttenloch, 1964).

Purpose of the Study

This study, while still constrained by the use of metalinguistic vocabulary, investigates several questions related to children's use of interword space as a convention and cue in written language:

1. To what degree are kindergarten children who have been exposed to a formal prereading program of instruction aware of interword space as a cueing convention in written language?
2. What is the relationship between this awareness and the ability to deal with language on an abstract level?
3. What is the relationship of these abilities for formal and informal measures of readiness?

Interword space is a convention in written language that is not perfectly reflected in speech. Yet it is a cue that becomes essential for proficient reading. Fisher (1975) and Hochberg (1970) have demonstrated that word space is utilized as a peripheral cue by readers past third grade. When space is filled speed of processing written text is significantly reduced for these readers.

It can be hypothesized that in the early stages of reading spacing serves as a different type of cue, marking boundaries of print to be associated with specific phonemic segments; and that this information either facilitates the establishment of correspondences between speech and print or develops along with these correspondences.

Several authors (Downing, 1974, Mattingly, 1972, Cazden, 1972) have suggested that the ability to treat language as an object, to deal with language apart from its meaning, may be a cognitive prerequisite for the development of proficiency with written language. This study investigates

the relationship between awareness of one aspect of graphic cueing, interword space, and children's ability to deal abstractly with language.

Method

Instrumentation

Awareness of interword space as a cueing convention

Interword space marks individual words in print. For proficient readers it cues the number of spoken equivalents that will be produced. The degree to which young children who are exposed for formal reading are aware of this convention was measured by a task which required children to judge whether a written stimulus corresponded to the number of words produced by the examiner.

Two aspects of children's awareness of one relationship between speech and print are required for successful performance on the word number task. First, children must be aware that spacing in print is a marker of word boundaries. Second, the child must have the notion that when more than one word is written more than one word is read and vice-versa; when there is only one word on the page only one word will be supplied in oral reading. The ability to demonstrate this second aspect of awareness assumes the first aspect (i. e. the ability to use word space to determine whether there is one or more than one word on the page).

Children's understanding of these notions was measured by showing 18 cards; half containing one word and the other half containing more than

one word. To determine whether meaning operated as a distractor therefore making it more difficult for students to respond to multi-word items that represented a unit of thought two types of multi-word stimuli were used. These were: sentences (Supermarkets are often crowded on weekends) and unconnected strings of words (Wear name hammer summer). Polysyllabic words were used to control against any word learning children might have acquired during their year of reading instruction. An effort was made to construct sentences using words that would be meaningful to students. The same words that were used to construct sentences appeared in the one word items and in the strings of words.

Insert Table 1 about here

Directions for the task were constructed so that the child's attention would be called to the number of words on the card and the length of the total wirtten stimulus. The child was also alerted to the fact that the examiner would not always read the stimuli correctly. The task was introduced to the child by telling him that they were going to play a "tricking" game. The subjects were asked to give examples of tricks they had played and the examiner gave an example. The subject's attention was called to the number of words on the page and the length of the stimuli by showing two examples and saying, "I'm going to show you some words written

down. Sometimes there are a lot of words. See, this sentence has 1 2, 3,4,5 words (examiner pointed to each word). See how long it is? Sometimes there is just one word (S is shown second card). See how short it is?" The subject was then told that the examiner would read the words on the card and the child was to tell whether the examiner really read exactly the number of words written on the card. The child was informed that sometimes the examiner would read exactly what was written on the page, but sometimes the examiner would try to trick the child by not reading all the words or by reading too many words.

The contrasts were gross, one word vs. four to seven words. The judgement required of the child was also gross. The examiner either read the exact number of words on the written stimulus or one word. It was felt that this task would be difficult. Therefore, maximum contrasts were important. Children were asked to judge whether the examiner read the same number of words as were printed on the card. The test situation always involved either a direct representation of the print or one that was a maximum contrast in terms of number.

Ability to deal with language on an abstract level

Ability to deal with language on an abstract level was measured by administering a word reversal task first used by Huttenlocher (1964). This is a 15 item task in which subjects are required to reverse word pairs pronounced by the examiner. Nine of the items form common word

sequences (red apple), while the remaining six involve words that can be grouped together (foot-hand) or letters and numbers (D - S).

Insert Table 2 about here

Huttenlocher and others (Karpova, 1966, Evans, 1975) have reported that young children have difficulty separating spoken words when these words make up meaningful units. Separation is a prerequisite for reversal and successful performance on this task requires that the child manipulate language, perceiving words as individual units and reversing their order.

Other measures of readiness for reading

The students in this study had been given the Metropolitan Readiness Test (1965) at the end of the school year. The total score was used as a traditional and formal measure of readiness. An additional measure of readiness was obtained by having the kindergarten teacher rate the students as to their readiness to profit from formal first grade instruction. Pupils were rated as ready to profit from the instruction that occurred in the first grade, as not ready, or as in transition. Transition was defined as not ready at the time of rating but there was a strong possibility that the child would be ready by September.

Subjects

The subjects in this study were 23 black kindergarten children from

a parochial school in Southeast Washington, D. C. The ages of these children ranged from 5 years 4 months to 6 years 4 months with a mean age of 5 years 9 months. All students had been exposed to formal reading instruction in the form of sound-symbol relationship training and Experience Chart reading. Those children judged ready were started in Level II of the Ginn 360 Reading Program.

Procedures

Testing was conducted in the last two weeks of the school year. Huttenlocher's word reversal task and the word number task were administered during one testing session. Testing time for each individual was approximately 10 minutes. Metropolitan Readiness Test scores already on file at the school were also taken on those students used in the study as well as a teacher estimate of reading readiness.

Results

Awareness of Space as a Written Language Cue

In spite of a year of formal reading instruction, few of these pupils were aware of space as a cue to the numbers of words read by the examiner. On the 18 item word number task the scores ranged from 6 to 16, the mean score was 11.

Insert Table 3 about here

Following the recommendation of Gulliksen (1950) an indication of awareness was considered to exist when a score of 15 was achieved. This point represents a score 2 standard deviations above the average chance score where the standard deviation is based on the variance of a distribution of chance scores. Using this definition as a criterion, only 13% of the students in this population demonstrated awareness. Item format did not have a significant effect upon performance.

The Relationship Between the Ability to Deal with Oral Language Abstractly and the Awareness of Space as a Written Language Cue

Scores of Huttenlocher's word reversal task, the measure of ability to deal abstractly with language used in this study, were significantly correlated with scores on the word number task, the measure of awareness of space as a cue in written language. The correlation coefficient was .50 indicating that performance on one task accounted for 25% of the variance on the other. Scores ranged from 0 to 15, mean score was 9.

Insert Table 4 about here

In this study everyone who fell within the knowledge range on the word boundary awareness task was within the knowledge range on the Huttenlocher task. The reverse was not true, however; successful performance on the Huttenlocher task did not guarantee success on the word boundary task.

Insert Table 5 about here

The Relationship of Other Measures of Readiness to the Awareness of Graphic Cueing to Word Representation

There was no significant relationship between performance on the Metropolitan Readiness Test (MRT) and the word number task or the Huttenlocher test. The correlation coefficient between the MRT and the word number tasks was .19. The relationship between the Huttenlocher task and MRT was .28.

Teacher judgement of readiness for a formal first grade reading program also failed to be significantly related to performance on the word number test. The correlation coefficient between these two tasks was .29. Teacher judgement of readiness was, however, significantly correlated with performance on the Huttenlocher test (.55) and the Metropolitan Readiness Test (.41).

Conclusions

Current thinking about the reading process emphasizes the relationship between oral and written language as well as the reader's predisposition to detect structure and make sense out of his world. While Smith and Goodman have stressed the similarity between learning to read and learning to talk, Downing and Mattingly have also stressed some differences in the

two processes. Mattingly (1972) in particular stresses that reading and writing are deliberately acquired language based skills that are dependent upon the individual's awareness of some primary aspects of linguistic activity. Downing (1976) has suggested that written language reflects those aspects of spoken language that are accessable to speakers through a linguistic awareness that is naturally endowed. (In fact, what is coded in print are those aspects of speech that are accessable to mature speakers.) Whether or not the child must as Downing suggests, recapitulate the history of written language, there are nevertheless some unique learnings associated with written language that are unfamiliar to the child in spite of the rather extensive prior experience with language in its spoken form.

The results of this study suggest that even after a year of formal reading instruction many young children are not able to demonstrate awareness that interword space serves as a cue to the fact that more than one word is encoded in print. In addition the ability to demonstrate awareness of the relationship of interword space in written language to speech is related to performance on a task that requires the child to manipulate language, treating it as an object. These results lead to the speculation that a certain cognitive objectivity or maturity goes hand in hand with the ability to demonstrate awareness of at least one technical feature of written language: the relationship of white spaces between

groups of printed letters and segments of spoken language.

The children in this study were young, well below the age when most professionals would recommend formal instruction or be concerned over lack of clarity about very abstract aspects of written or spoken language. Such clarity develops through extensive experiences with written language.

However, the results also suggest that some children may be more able than others to treat language as an object and this ability seems to facilitate awareness of the relationship between interword space in written language and its spoken equivalent.

More puzzling is the relationship of the tasks measuring word boundary awareness and ability to manipulate oral language to measures of readiness. The word number task, the measure of space as a cue to the number of words encoded in print, was not related to either formal or informal measures of readiness. The Huttenlocher task, a measure of the ability to treat language as an object, however, was significantly related to teacher judgment of readiness. This task was not realted to performance on the Metropolitan Readiness Test, a formal standardized measure of readiness. It is possible that teachers have many opportunities to observe children in oral language situations that require them to treat language as an object. One thing that differentiates formal schooling from the natural informal learning that occurs prior to schooling is an emphasis on formal language activities. Thus teachers may be more aware of individual

differences in this area because they have more opportunities to observe these differences. Awareness of technical features of language like interword space, however, may be difficult to observe. Teachers know when children fail to recognize words, the reasons for this failure are not always clear. In addition, the functions of interword space may not be apparent to teachers because their reading skill is an automatic process and they may be less aware of its importance in the early stages and later stages of reading.

Recommendations for future research

The results of this study are limited to a restricted population. Further investigations should be undertaken to determine if the results are maintained for other student populations.

The importance of awareness of interword space needs to be investigated longitudinally. It was hypothesized that awareness of this convention facilitates the abstraction of rules of correspondence between spoken and written words. This can only be tested by research which investigates the relationship of early awareness of interword space to late achievement in reading. Such longitudinal research should, however, take into consideration the fact that aspects of print may serve different purposes at different stages of reading proficiency.

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Table 1

Items on the Word Number Task used in the Measurement of Word Boundary Awareness

Written Stimulus	Examiner Reads
1. Diamond	Diamonds sparkle in the sun
2. Supermarkets are often crowded on weekends	Supermarkets
3. Wagons silver distance often	Wagons silver distance often
4. Photographers take your picture with a camera	Photographers take your picture with a camera
5. Salamander	Salamanders can be found in ponds and streams
6. Dandelion	Dandelion
7. Stayed kangaroo supermarket silk	Stayed
8. Stationwagons are large automobiles	Stationswagons are large automobiles
9. Monument	Monument
10. Waffles are delicious for breakfast	Waffles are delicious for breakfast
11. Picture scarves delicious crowded western	Picture
12. Somersault	Somersault
13. Buffalo roam the western prairie	Buffalo
14. Frequently prairie automobiles large name	Frequently
15. Things carpenter another roam	Things carpenter another roam
16. Magicians sometimes wear silk scarves	Magicians
17. Penguin	Penguins waddle when they walk around
18. Wear name hammer summer	Wear name hammer summer

Table 2. Pairs of Items on the Huttenlocher Word Reversal Task

Category	Pairs		
I	5 - 2;	D - S;	3 - 7
II	Black-White;	child-lady;	foot-hand
III	man-runs;	red-apple;	she-went
IV	I-do;	you-are;	it-is
V	table-goes;	house-did;	orange-cow

Table 3

Means and Standard Deviations

	Mean	S. D.
Word # Task (18)[a]	10.6957	2.6187
Huttenlocher (15)[a]	9.3478	5.5971
Metropolitan	51.4783	6.0893
Teacher Judgement	1.0870	0.8482

a = total number of items
N = 23

Table 4

Pearson Product Moment Correlation Coefficients

	Word #	Hunt.	Metropolitan	Teacher
Word # Task	------	.5037**	.1948	.2785
Huttenlocher		-----	.2790	.5487**
Metropolitan			-----	.4140*
Teacher Judgement				-----

**p<.01
*p<.05

N=23

Table 5

Students at Mastery on the Word Boundaries Task and on the Huttenlocher Task

Students at Mastery on Huttenlocher Task	Score	Word Boundary Task	Mastery
1	15	16	*
2	15	14	*
3	14	13	*
4	14	15	*
5	14	15	*
6	14	12	
7	14	11	
8	14	09	
9	14	07	
(39%)			(13%)

Total N = 23